

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Nobuhiro NISHIYAMA et al.

Application No. 10/695,001

Confirmation No. 5307

Filed: October 29, 2003

Art Unit: 2828

For: SEMICONDUCTOR LASER ASSEMBLY

Examiner: T. N. Nguyen

**APPEAL BRIEF**

MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This brief is filed more than two months after the Notice of Appeal filed in this case on July 9, 2007, and within one month of the Notice of Panel Decision from Pre-Appeal Brief Review, mailed on October 16, 2007.

The fees required under § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

- I. Real Party In Interest
- II. Related Appeals and Interferences
- III. Status of Claims
- IV. Status of Amendments

- V. Summary of Claimed Subject Matter
- VI. Grounds of Rejection to be Reviewed on Appeal
- VII. Argument
- Appendix A: Claims Appendix
- Appendix B: Evidence Appendix
- Appendix C: Related Proceedings Appendix

## **I. REAL PARTY IN INTEREST**

The real party in interest for this appeal is: SHARP KABUSHIKI KAISHA

## **II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS**

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

## **III. STATUS OF CLAIMS**

There are 14 claims pending in this application. The claims on appeal are claims 1-10, 13 and 14. No claims have been canceled or withdrawn from consideration.

Claims 1-14 are pending. Claims 1-10, 13 and 14 stand rejected. Claims 11 and 12 stand objected to.

## **IV. STATUS OF AMENDMENTS**

Appellants did not file an Amendment after Final Rejection.

## **V. SUMMARY OF CLAIMED SUBJECT MATTER**

As disclosed by way of the exemplary embodiment depicted in Figures 1A, 1B and 1C, and described at least at paragraphs [0049] through [0058], independent claim 1 recites a semiconductor laser assembly.

The semiconductor laser assembly comprises a substrate 10 (shown as a metal lead) including a first mount surface 10a and a second mount surface 10b (paragraph [0050]). A submount 3 is mounted on the first mount surface 10a of the substrate 10 (paragraph [0050]). A laser diode 1 is mounted on the submount 3 (paragraph [0051]) and has at least one light emission point 13a, 13b (paragraphs [0049] and [0051]) and an electrode (not shown). A monitoring photodiode 4 is mounted on the second mount surface 10b of the substrate 10 and has a light-receiving surface 6 (paragraph [0051]) which receives light emitted from the light emission point 13b, and a relay electrode 4a connected to the electrode of the laser diode 1 by a metal wire 5a (paragraph [0052]).

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Claims 1-6 stand rejected under 35 USC 102(b) on Lebby (U.S. Patent No. 5,838,703).

Claims 7-10 stand rejected under 35 USC 103(a) on Lebby.

Claims 13 and 14 stand rejected under 35 USC 103(a) on Lebby in view of Appellants' Admitted Prior Art, Figure 7A (hereinafter, "AAPA").

## **VII. ARGUMENT**

### **A. Lebby Does Not Disclose a Laser Diode Mounted on a Submount**

Claims 1-6 stand rejected under 35 USC 102(b) on Lebby (U.S. Patent No. 5,838,703). Appellants respectfully traverse this rejection. Lebby does not disclose or suggest "a submount mounted on the first mount surface of the substrate" or "a laser diode mounted on the

submount,” as recited in appellants’ claim 1. The Examiner has relied solely on Figure 1 of Lebby as disclosing these features, even though Figure 1 makes no such disclosure. Accordingly, the rejection should be reversed.

The Examiner has cited Figure 1 of Lebby as disclosing a substrate 13, a laser device 14 and “a submount under laser 14 mounted on first submount surface of substrate 13.” Appellants respectfully disagree. Lebby does not disclose a submount under the laser 14; Lebby discloses a single laser device 14 having two layers. Although Figure 1 of Lebby shows a two layer structure on the chip 13, both layers (a ridge layer and an active layer) are parts of the laser 14, and are not the separate laser and submount recited in claim 1.

As disclosed in col. 3, line 23, through col. 4, line 10, of Lebby, reference numeral 14 refers to a Vertical Cavity Surface Emitting Laser (hereinafter, “VCSEL”) which comprises both a ridge and an active region as shown in Figure 1 of Lebby. Lebby discloses using ridge VCSELs having a ridge layer and an active layer. Further support for Lebby’s use of VCSELs is found at col. 3, line 55, through col. 4, line 2, of Lebby’s specification, which states “A complete disclosure of the construction of VCSELs, such as intended for use in the present invention, and more particularly the construction of ridge VCSELs is available in U.S. Patent No. 5,256,596 entitled ‘Top Emitting VCSEL with Implant.’” The cited patent further depicts and details two layer VCSELs. Lebby does not disclose or suggest any alternate type of lasers, nor does Lebby disclose or suggest mounting a laser on a submount. Accordingly, Lebby clearly uses reference numeral 14 to identify a VCSEL having a ridge layer and an active layer, and these layers are both shown in Figures 1 and 2.

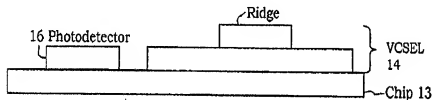
Appellants respectfully submit that the Examiner has misinterpreted the active region of the VCSEL 14 as a submount. Additional support for appellants’ position can be found in Figure 2 of Lebby, which discloses a VCSEL 46 similar to that shown in Figure 1 (col. 3, lines 31 and 32 and col. 5, lines 35-41).

As shown in Figure 2, the VCSEL 46 is identified by a lead line connected to the active region of the VCSEL 46 rather than the ridge portion of the VCSEL as in Figure 1. By identifying VCSELs 14 and 46 using lead lines pointing to the ridge portion and the active portion, respectively, Lebby implicitly indicates that both layers (the ridge layer and the active layer) are parts of the VCSEL devices. The difference in the location of the leadlines was not important to the drafters of Lebby because the layers are part of the same VCSEL devices.

Furthermore, the specification of Lebby does not give any suggestion that the laser devices 14 and 46 are mounted on a submount. By identifying the active layer of the VCSELs 14 and 46 as submounts, the Examiner is merely highlighting his misinterpretation of Lebby.

Although, as noted by the Examiner, Figures 1 and 2 depict different embodiments with respect to the photodiodes 16 and 48, the specification of Lebby indicates that the VCSEL devices 14 and 46 are similar (col. 3, lines 31 and 32 and col. 5, lines 35-41).

To help clarify appellants' remarks, appellants have reproduced the relevant portion of Figure 1 of Lebby below, including identifiers added by appellants.



The rejection should be reversed.

#### **B. Lebby Does Not Disclose a Relay Electrode**

Lebby does not disclose or suggest "a relay electrode connected to the electrode of the laser diode by a metal wire" as recited in claim 1. The Examiner has cited the "plurality of bond wire

interconnects 26” which connect the VCSEL 14 and the photodetector 16 as shown in Figure 1 of Lebby and described at col. 5, lines 22-25, as disclosing this feature. However, although Lebby may disclose a metal wire, Lebby does not disclose or suggest a relay electrode connected to a wire as recited in claim 1.

The Examiner has merely asserted that VCSEL devices use relay electrodes without providing any support for the assertion or disclosure of such a feature in the cited reference.

This rejection should be reversed.

**C. Claims 7-10 Depend From Allowable Claim 1**

Claims 7-10 stand rejected under 35 USC 103(a) on Lebby. As discussed above, Lebby fails to disclose or suggest both a submount and a relay electrode as recited in claim 1, which is therefore allowable. Accordingly, claims 7-10, which depend from claim 1, are allowable due at least to their respective dependencies. This rejection should be reversed.

**D. Claims 13 and 14 Depend From Allowable Claim 1**

Claims 13 and 14 stand rejected under 35 USC 103(a) on Lebby in view of Appellants’ Admitted Prior Art, Figure 7A (hereinafter, “AAPA”). AAPA, as shown in Figure 7A, was cited only as disclosing a metal wire attached to the substrate, and fails to overcome the deficiencies of Lebby as described above with respect to claim 1. Accordingly, claims 13 and 14, which depend from claim 1, are allowable due at least to their respective dependencies. This rejection should be reversed.

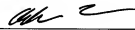
**E. Conclusion**

In light of the above, the rejections of record are improper and should be reversed and claims 1-14 should be allowed.

In the event the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, appellants petition for any required relief, including extensions of time, and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing Attorney Docket No. **204552030600**.

Dated: October 24, 2007

Respectfully submitted,

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**APPENDIX A**

**Claims Involved in the Appeal of Application Serial No. 10/695,001**

1. A semiconductor laser assembly comprising:  
a substrate including a first mount surface and a second mount surface;  
a submount mounted on the first mount surface of the substrate;  
a laser diode mounted on the submount and having at least one light emission point and an electrode; and  
a monitoring photodiode mounted on the second mount surface of the substrate and having a light-receiving surface which receives light emitted from the light emission point, and a relay electrode connected to the electrode of the laser diode by a metal wire.
2. The semiconductor laser assembly according to claim 1, wherein a height of the first mount surface in a direction normal to an upper surface of the substrate is higher than that of the second mount surface.
3. The semiconductor laser assembly according to claim 2, wherein, as seen from above, the metal wire is disposed approximately consistent with an optical axis of the laser diode.
4. The semiconductor laser assembly according to claim 1, wherein the light-receiving surface of the monitoring photodiode is located approximately at the same height as or lower than the light emission point of the laser diode.



5. The semiconductor laser assembly according to claim 1, wherein the first and second mount surfaces of the substrate and a laser diode mount surface of the submount are approximately parallel to one another.

6. The semiconductor laser assembly according to claim 5, the laser diode mount surface of the submount is approximately at the same height as the light-receiving surface of the monitoring photodiode.

7. The semiconductor laser assembly according to claim 1, wherein the submount is made of an insulating material having higher heat conductivity than the monitoring photodiode.

8. The semiconductor laser assembly according to claim 1, wherein the submount has a length in a direction of an optical axis of the laser diode that is approximately equal to a resonator length of the laser diode.

9. The semiconductor laser assembly according to claim 1, wherein at least one additional laser diode is mounted on the submount, said additional laser diode also has at least one light emission point and an electrode, and the monitoring photodiode is provided with an additional relay electrode connected to the electrode of said additional laser diode by a metal wire.

10. The semiconductor laser assembly according to claim 1, wherein the laser diode has a plurality of light emission points.

11. The semiconductor laser assembly according to claim 1, wherein two separated metal layers are disposed on the submount, and the laser diode is mounted on the submount through the metal layers in a junction-down manner.

12. The semiconductor laser assembly according to claim 11, wherein the laser diode has two light emission points from which the laser diode emits laser beams with different wavelengths, and electric power is supplied to the laser diode through each of the metal layers, independently of each other so that the two light emission points are controlled independently.

13. The semiconductor laser assembly according to claim 1, wherein the substrate is composed of a metal lead.

14. The semiconductor laser assembly according to claim 1, wherein the relay electrode is connected to an electrode on the substrate by a metal wire.

**APPENDIX B:**

**EVIDENCE APPENDIX**

**[NONE]**

**APPENDIX C**

**RELATED PROCEEDINGS APPENDIX**

[NONE]